

A NEW TREMATODE (STYPHLODORA BASCANIENSIS)  
WITH A BLIND LAURER'S CANAL.

---

By JOSEPH GOLDBERGER,

*Passed Assistant Surgeon, U. S. Public Health and Marine-Hospital Service.*

---

While studying the helminthological collections in the U. S. National Museum, I found three toto mounts, one series of frontal sections, and six specimens in glycerine-alcohol all of one species of a trematode from the liver of a *Bascanion constrictor* collected by Dr. Albert Hassall near Alexandria, Virginia, on July 13, 1892. One of the toto mounts was presented to Prof. Ch. Wardell Stiles by Doctor Hassall, while the remaining specimens form a part of the Hassall collection.

For the privilege of studying this material I am indebted to both Doctor Hassall and Professor Stiles.

EXTERNAL CHARACTERS.

*Size.*—The specimens in alcohol vary in length from 3.8 to 4.88 mm. and in width from 1.72 to 2.92 mm.; the three mounted specimens vary from 3.7 to 5 mm. in maximum length and from 2 to 3 mm. in maximum width.

*Color.*—The worms in alcohol are of an olive green tint with a dark area corresponding to the egg-distended uterine coils.

*Form.*—The body is dorso-ventrally flattened; in ventral view it is oval in outline with a somewhat attenuated, bluntly pointed oral end and a bluntly rounded caudal margin. A transverse section near the cephalic end is subcircular in outline; farther caudad transverse sections are elliptical with relatively very short dorso-ventral diameter. Thus, a transverse section in the testicular zone of one specimen measures 1.42 mm. in transverse diameter and 0.375 mm. in dorso-ventral diameter.

*Surface.*—The surface cuticle is thin, measuring about  $4\ \mu$  in thickness and is armed with delicate spines. The spines are not very numerous and do not appear to be uniformly distributed, being very

sparse or altogether absent at the caudal pole. In the median line of the venter, at about the junction of the cephalic with the middle third of the body length, is the circular aperture of the acetabulum. At a point about the acetabular diameter cephalad of the cephalic

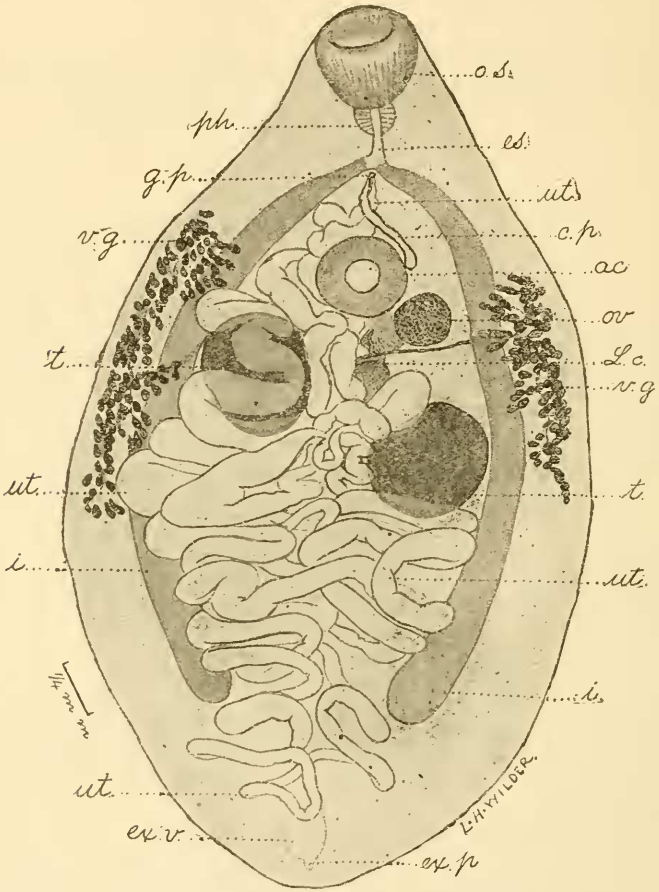


FIG. 1.—VENTRAL VIEW SHOWING TOPOGRAPHY. *ac.*, ACETABULUM; *c. p.*, CIRRUS POUCH; *es.*, ESOPHAGUS; *ex. p.*, EXCRETORY PORE; *ex. v.*, EXCRETORY VESICLE; *g. p.*, GENITAL PORE; *i.*, INTESTINE; *L. c.*, LAURER'S CANAL; *o. s.*, ORAL SUCKER; *ov.*, OVARY; *ph.*, PHARYNX; *t.*, TESTIS; *ut.*, UTERUS; *v. g.*, VITELLARIA. FROM A PRESS PREPARATION. ENLARGED. ORIGINAL.

margin of the acetabulum and in or very slightly to the right of the median line is the genital pore.

*Acetabulum.*—The acetabulum varies in diameter in four sectioned specimens between 0.270 and 0.345 mm. It is of a loose-meshed structure like that in *Athesmia foxi*.<sup>1</sup> Its aperture appears to be somewhat smaller than that of the mouth.

<sup>1</sup> Goldberger and Crane, 1911.

## INTERNAL ANATOMY.

*Digestive tract.*—The oral aperture is ventro-terminal in position, circular in outline, and somewhat larger than the aperture of the acetabulum. It leads into a well-developed oral sucker. The latter, measured in sections, varies between 0.420 and 0.435 mm. in maximum longitudinal, 0.300 and 0.315 mm. in maximum dorso-ventral, and between 0.300 and 0.360 mm. in maximum transverse diameter. It is therefore somewhat larger than the acetabulum. Its structure

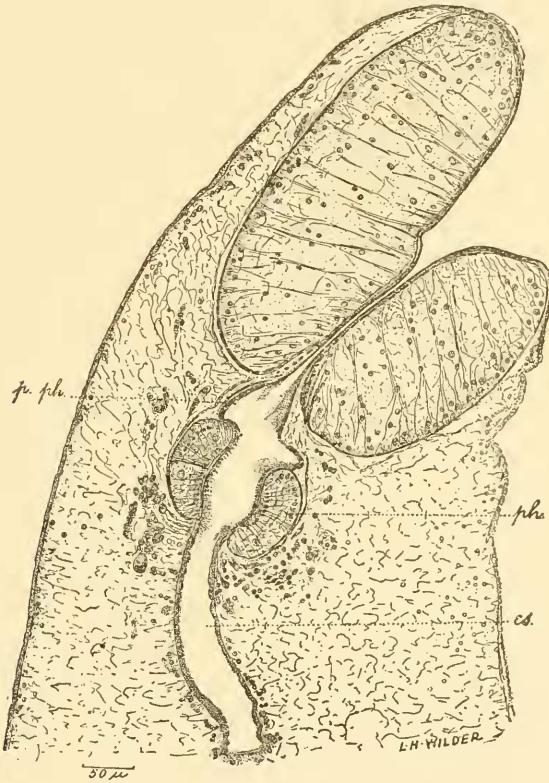


FIG. 2.—SAGITTAL SECTION TO SHOW PREPHARYNGEAL ATRIUM. *p. ph.*, PREPHARYNX. (FOR OTHER LETTERING SEE FIG. 1.) ENLARGED. ORIGINAL.

is of the same loose-meshed character as the acetabulum. Attached to the base of the oral sucker is a relatively roomy prepharyngeal atrium or prepharynx (fig. 2). This is succeeded by a pharynx that measures about 0.105 mm. in longitudinal diameter. Around the base of the latter is an accumulation of gland cells. In its turn the pharynx is succeeded by an esophagus that forks laterally into the intestinal caeca at a point just cephalad of the level of the genital pore. The intestinal caeca pass caudad paralleling the lateral body margins, to terminate in slightly separate planes at about the level of junction

of the penultimate with the caudal fifth of the body length. The ceca are narrowest at the esophageal ends; their diameter increases slightly in the direction of their cecal extremities. The oral sucker, prepharynx, pharynx, and esophagus are lined with a cuticular layer; the intestinal lumen is lined by a layer of large cubical epithelial cells.

*Genital system—Male organs.*—The testes are in the intercecal area in a zone slightly preequatorial. They are placed one to the right and the other to the left of the median sagittal plane, near the mesial or mesio-ventral aspect of the corresponding gut, but not abutting the field of the latter, although in press preparations they may appear to do so (as for instance in fig. 1 drawn from a press preparation). The testicular zones overlap more or less, but do not coincide, and their fields are separate. The cephalically placed testis may belong to the right or to the left side; in four of seven specimens studied the right testis is in advance, in three it is the left. The testes are irregularly globular in form, without surface indentations, approximately equal in size, and measure about 0.195 mm. in diameter. A relatively stout-walled vas efferens springs from the cephalic aspect of each. Each vas passes mesio-cephalad assuming a position close to the dorsal aspect of the corresponding ramus of the excretory vesicle. The vas of the side in which the ovary is placed passes in its course in close relation first to the ventral aspect of the globular cecal end of Laurer's canal, then close to the ventral aspect of the receptaculum seminis; later it passes close to the mesial aspect of the ovary, between the latter and the shell gland. Cephalad of the shell gland, the vas tends toward the axial region to meet and unite with its fellow at the base of the cirrus pouch. The cirrus sac is an elongate cylindrical thin-walled structure measuring about 0.525 mm. in length and about 0.105 mm. in maximum diameter. It incloses a slightly coiled vesicula, a short prostatica, and a protrusile cirrus. With the cirrus retracted the ductus ejaculatorius discharges into an atrium which also receives the vagina. The pouch lies dorso-cephalad of the acetabulum, its axis directed obliquely cephalo-ventrad. In press preparations (fig. 1) the pouch appears to take a somewhat curved (crescentic) course laterally of the acetabulum somewhat as described and pictured by Looss<sup>1</sup> for *Styphlodora solitaria*; in sections, however, one finds that the pouch, although submedian, is, as here described, dorso-cephalad, not lateral of the acetabulum. The base of the pouch is in a plane slightly cephalad of the caudal margin of the acetabulum.

*Female organs.*—The ovary is a globular body, somewhat smaller than the acetabulum and considerably smaller than the testes; it is placed to one side of the median plane in a zone that abuts or slightly overlaps the acetabular zone cephalically, and is separated to a variable extent from the zone of the cephalically placed testis, caudally.

<sup>1</sup>1902, p. 506, fig. 24.

It is placed in the same side of the intercecal area as is the caudally placed testis within whose field the ovarian field falls. The oviduct springs from the dorso-mesial aspect of the ovary and tends dorso-mesially and caudad. Almost immediately after its origin it receives a short duct from the receptaculum seminis; a little beyond this point it gives off a duct that passes caudad close to the ventral aspect of the receptaculum seminis at the level of the caudal margin of which it dilates into a globular body of about the size of the ovary (fig. 3). This duct corresponds, in its relation to the oviduct, and in its structure, to Laurer's canal, but instead of passing to and opening on the surface it ends in the manner described for Laurer's canal in *Aspidogaster conchicola*. The globular cecal end of this canal contains spermatozoa, sperm-morulas, round deeply staining bodies suggesting nuclei and a few vitelline cells. Immediately after the origin of

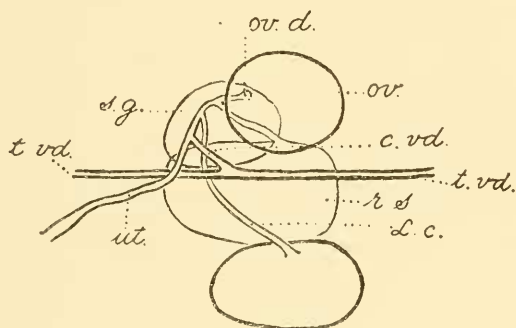


FIG. 3.—DIAGRAM TO SHOW RELATIONS OF LAURER'S CANAL AND ITS GLOBULAR END. *c. vd.*, COMMON VITULLO-DUCT; *ov. d.*, OVIDUCT; *r. s.*, RECEPTACULUM SEMINIS; *s. g.*, SHELL GLAND; *t. vd.*, TRANSVERSE VITELLO-DUCT. (FOR OTHER LETTERING SEE FIG. 1.) ORIGINAL.

Laurer's canal the oviduct enters an ill-defined, irregular mass of cells forming the shell-gland within which it is joined by the common vitello-duct to form the ootype. The shell gland lies close to the mesial and mesio-dorsal aspect of the ovary and close to the ventral aspect of the receptaculum seminis. The seminal receptacle is an ovoid structure somewhat larger than the ovary close to the dorso-caudal aspect of which it lies; it is filled with spermatozoa. The uterus, a continuation of the ootype, emerges from what may be regarded as the ventral aspect of the shell gland, passes ventrad, then caudad. The uterine coils extend to quite near the caudal margin; they fill the posttesticular portion of the intercecal area and its extension caudad. There is a descending and an ascending uterine limb that may be distinguished by the difference in the tint of the contained eggs, the eggs in the ascending limb being the darker. Both limbs form transverse coils in adjacent (right and left) lateral

fields that are distinct, but dovetail to some extent. In one of the preparations one of the transverse coils of the ascending limb lies on the opposite side, among the coils of the descending limb. As the uterus enters the testicular zone its coils fill the area between the testes, encroaching to some extent on the testicular fields; then it ascends laterally of the mesial aspect of the ovary to assume a more simple course cephalad of the latter and dorsally of the cirrus sac to discharge finally into the genital atrium.

The vitellaria, consisting of a moderate number of groups of a well-developed follicles, are situated ventro-laterally of the intestinal ceca in a zone the cephalic limit of which is a plane slightly caudad of the cephalic margin of the acetabulum and the caudal limit, the plane of the caudal margin of the caudal testis. In one of the preparations the grouping of the follicles is very clearly evident; each gland in this specimen appears to be made up of nine groups. A duct leaves each group of follicles; these ducts unite to form one or two secondary yolk ducts that leave each gland to pass toward the axial region dorsally of the gut. When two ducts leave the gland they unite later to form a single transverse vitelloguct. The transverse duct of one side unites with its fellow of the other side close to the ventro-caudal aspect of the shell gland to form a common duct. The common duct passes cephalo-dorsad into the shell gland to unite with the oviduct as already described (fig. 3).

*Excretory system.*—The excretory bladder is roomy and is in the form of a Y. The lateral stems are short; beginning at about the level of the cephalic margin of the globular cecal end of Laurer's canal they unite at the level of its caudal margin to form the median stem. This passes caudad in the intercecal area dorsally of the folds of the uterus and between the testes to near the caudal margin, terminating by a short duct that discharges on the dorsal surface at a point slightly removed from the caudal margin.

#### SYSTEMATIC POSITION.

From the foregoing description it will be seen that in the topographic relations of its organs this worm conforms to the diagnosis of the genus *Styphlodora* Looss.<sup>1</sup> I therefore place this worm in this genus under the name of *Styphlodora bascaniensis*. It stands close to *Styphlodora solitaria* Looss, from which, however, it differs in several respects most notably in that Laurer's canal instead of opening on the dorsum terminates blindly. This peculiarity of Laurer's canal has heretofore been noted, so far as I am aware, only in one other trematode, namely, *Aspidogaster conchicola*.

The specific diagnosis of *Styphlodora bascaniensis* may be summarized as follows:

<sup>1</sup> 1902, p. 507.

*Specific diagnosis.*—Dorso-ventrally flattened, oval distomes with bluntly pointed oral and rounded caudal margin, 3.8 to 4.88 mm. long by 1.72 to 2.92 mm. wide. Cuticle  $4\mu$  thick, armed with delicate spines which are few or absent at caudal pole; acetabulum at junction of cephalic and middle third of body; genital pore the length of acetabular diameter preacetabular, submedian. Oral aperture ventro-terminal, larger than acetabular aperture; oral sucker larger than acetabulum; pharynx present with prepharyngeal atrium; esophagus short, forks just cephalad of level of genital pore; ceca terminate at level of junction of penultimate with caudal fifth of body length.

Testes irregularly globular, smooth, equal, right and left, pre-equatorial, postacetabular, in intercecal area; testicular zones overlap, fields are separate. Cirrus pouch present, dorso-cephalad of acetabulum; incloses a vesicula, a short prostatica and a protrusile cirrus.

Ovary is globular, smooth, smaller than acetabulum or testis, submedian; ovarian zone abuts or overlaps caudal limit of acetabular zone. Laurer's canal present, but terminates in a blind globular end. Receptaculum seminis present, large. Uterus with descending and ascending limb in separate, right and left, adjacent fields, extends to near caudal margin, intercecal. Vitellaria ventrolateral of ceca; follicles in groups extend from slightly caudad of cephalic margin of acetabulum to plane of caudal margin of caudal testis. Excretory bladder roomy, Y shaped. Excretory pore dorso-subterminal.

*Habitat.*—Liver of *Bascanion constrictor*, Virginia, U. S. A.

*Type.*—Cat. No. 7326, U.S.N.M.; cotypes No. 5863 and No. 7112.

#### REFERENCES.

- BRAUN, 1892.—Vermes, Bronn's Klass. u. Ordnung. d. Thier-Reichs. Leipzig, vol. 4, Abth. Ia; Lief. 21-23, pp. 715-716.
- GOLDBERGER and CRANE, 1911.—A new species of *Athesmia* from a monkey. Bull. No. 71, Hyg. Lab. U. S. Publ. Health & Mar.-Hosp. Serv., Washington.
- LOOSS, 1902.—Ueber neue und bekannte trematoden aus Seeschildkröten. Zool. Jahrb., Jena, Abth. f. Syst., vol. 5, pp. 411-894.
- STAFFORD, 1896.—Anatomical structure of *Aspidogaster conchicola*. Diss. (Leipzig).
- VOELTZKOV, 1888.—*Aspidogaster conchicola*. Arb. a. d. zoolzootom. Inst. in Wurzburg, Wiesbaden, vol. 8, pp. 249-289.

Bibliographic citations are from Stiles and Hassall's Index Catalogue of Medical and Veterinary Zoology (Authors: Bull. 39, Bureau of Animal Industry; Trematoda: Bull. 37. Hygienic Laboratory, U. S. Pub. Health & Marine-Hosp. Serv., Washington, D. C.).